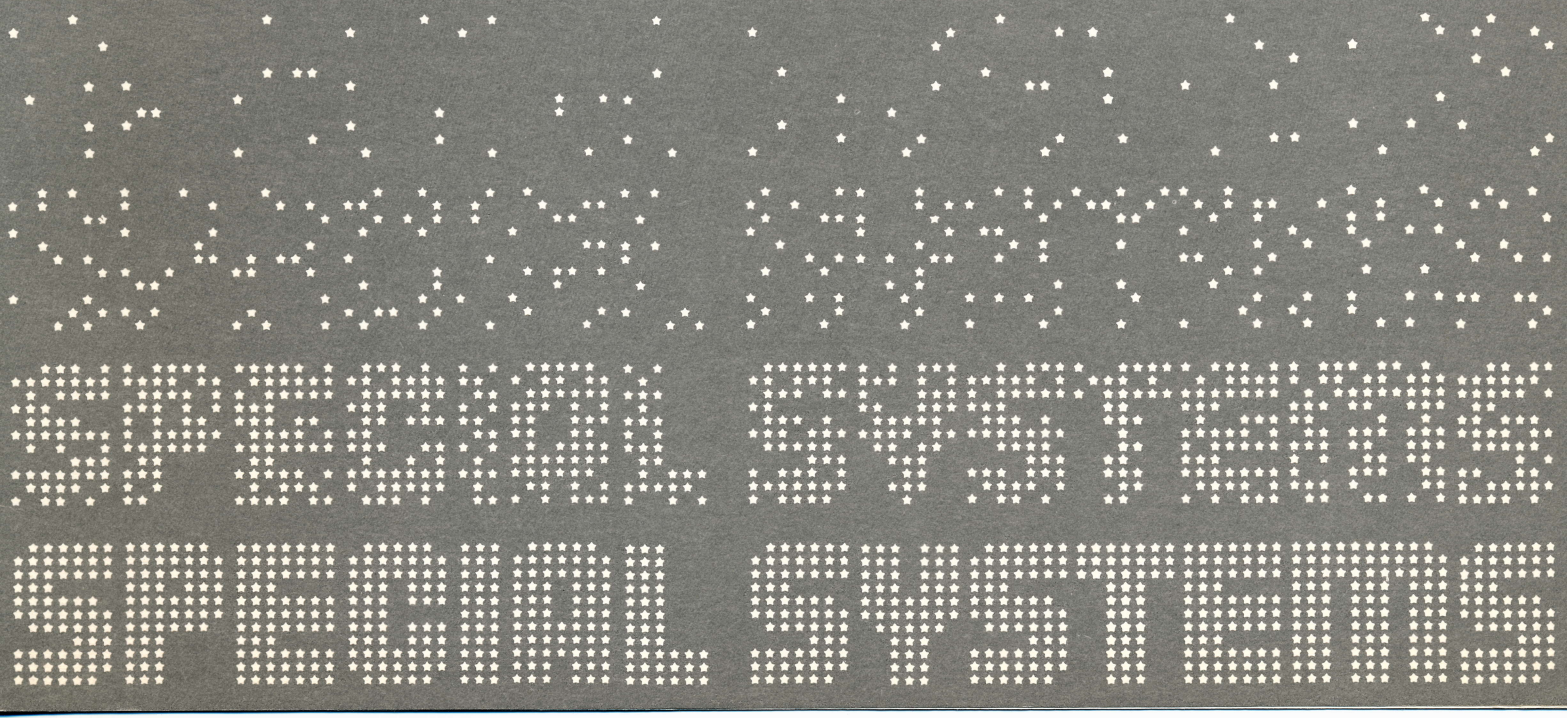
Sharp Special Systems



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Sharp Special Systems
A Division of I.P. Sharp Associates Limited

1 Introduction

Sharp Special Systems is the division of I.P. Sharp Associates Limited devoted to the specification and implementation of minicomputer-based systems. Since the company was formed in 1964, we have implemented systems on a wide range of minicomputers built by more than a dozen different manufacturers.

Sharp Special Systems has successfully developed computer systems for process control, telecommunications, research and business accounting applications; and has established an enviable reputation for technical excellence and reliability.

I.P. Sharp Associates was incorporated in Toronto as a firm of consultants in computer hardware and software. Our head office is still in Toronto, but the original staff of eight consultants has grown to more than three hundred computer professionals in offices across Canada, the United States, Great Britain and Western Europe. Today I.P. Sharp Associates is one of the largest, and oldest, Canadian-owned computer services companies.

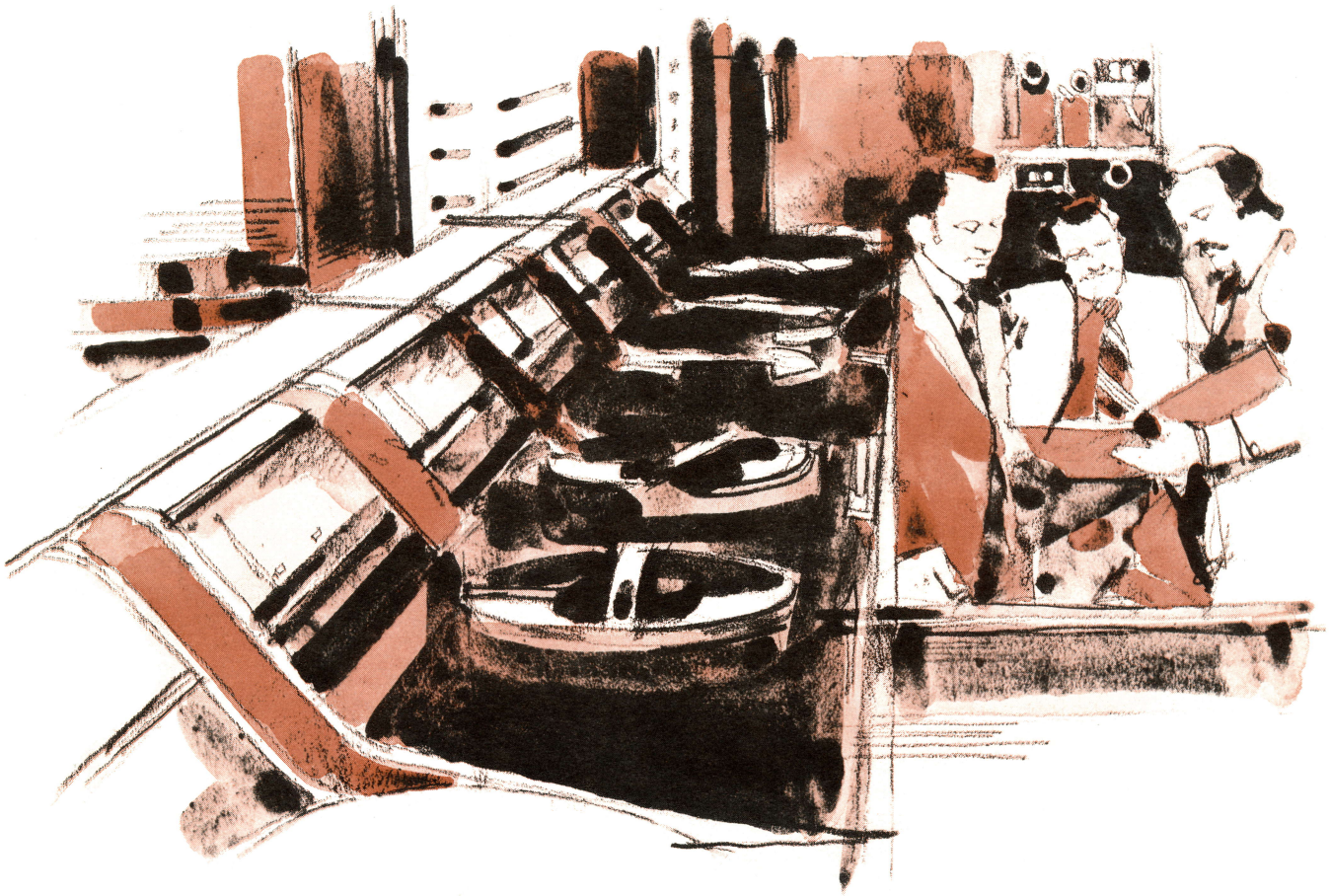
The company at present consists of two major divisions, the Special Systems Division and the Computer Services Division. The Computer Services Division operates our highly successful SHARP APL timesharing service.

APL was originally devised by Kenneth A. Iverson as a notation (or set of symbols) for the precise, concise and consistent description of mathematical concepts. I.P. Sharp Associates participated in the first computer implementation of the language by IBM, and we have since written or assisted in writing six versions of APL under contract to IBM and other mainframe manufacturers.

In 1969, we pioneered with the first commercial APL timesharing service, and our many language and system enhancements have helped make SHARP APL the "industry standard". Also in 1969, the company entered the turnkey system market with the production of two spectrometer digital readout systems for the Canadian Department of Energy, Mines and Resources. One of these systems was subsequently used in the analysis of Canada's share of the first moonrock samples.

The production of turnkey systems now represents a major portion of our Special Systems Division business, and we are proud of the fact that a high percentage of this business comes from referrals.

2 Staff and Facilities



Since the company was formed, I.P. Sharp Associates has been heavily involved in the design and implementation of minicomputer-based systems for a wide variety of applications. In 1973, the company's minicomputer-related activities were amalgamated under the Special Systems Division.

I.P. Sharp Associates' Special Systems Division now has permanent operations in our Toronto, Ottawa, Rochester and Amsterdam offices. The Special Systems Division facilities in these offices include staff, large modern offices and fully-equipped computer rooms. These facilities allow us the flexibility to develop systems either at the customer's site or on our own premises for later delivery to the customer.

Although the Special Systems Division is located in offices which are quite far apart geographically, there is close and continuing coordination between offices at both the management and technical level. With the increasing sophistication and complexity of minicomputer systems, the investment in learning about a particular hardware or software product is considerable. It is a distinct advantage, both to ourselves and to our clients, that expertise gained in any office be made readily available, when required, to all other offices.

The nature of the work we do in the Special Systems Division demands the very best in staff. The vast majority of our jobs are performed on a fixed-price basis. This requires not only state-of-the-art knowledge of the hardware and software tools available, but also the ability to assess – accurately – the resources which will be necessary for successful implementation. And success to Sharp Special Systems means not only getting the job done to the client's satisfaction, but also on time and within budget.

3 Turnkey Systems

The Oxford dictionary defines "turnkey" as "one who has charge of the keys in a prison; a jailer". With respect to computers, it describes systems purchased on a "packaged" basis, including the custom-programmed applications software as well as the computer and peripherals. The analogy is that when the system is delivered, the user has only to turn on the key and the system will start doing the job for which it was designed.

Minicomputer system development – both hardware and software – has provided tools for cost-effective automation of a growing range of applications. This includes both applications for which traditional mainframe computers are not suited, as well as the large number of medium- and small-sized companies which cannot justify the cost of a large computer.

Sharp Special Systems is a "systems-house", and as such we provide turnkey solutions to data processing problems.

Putting together a computer system is both demanding and specialized work. It involves studying the application, recommending and acquiring the appropriate hardware, ensuring that it is properly installed and integrated, specifying and producing the applications software, arranging for maintenance, and training in the use and operation of the system.

Today, many firms acquiring and using minicomputer systems have little or no in-house computer systems expertise. In other instances, automating a particular operation would require a temporary increase in staff. In both cases, the role of the systemhouse is extremely important.

The first step towards a successful turnkey implementation is a clear definition of the job that the computer is expected to do. You are the best judge of what you want your computer system to do, and it is our responsibility to understand your requirements and to design a hardware/software system that will work for you.

One ingredient essential to the success of any project is an effective collaboration between the people who are building the system and the people who are going to use it. We think we're likeable people, and that of course makes any cooperative effort easier.

But a common language and vocabulary are just as important. Some of our clients are as conversant with computers and computer jargon as we are, and that's nice, but it is far more important for us to understand your application.

In the beginning, minicomputers were used almost exclusively in industrial or research environments. But we at Sharp have been active in all areas of electronic data processing, so whatever your business is – counting apples or analysing moon-rock samples or keeping track of pension funds – it's likely that we've done something the same or very similar before.

4 System types

Plant Information systems

Plant Information systems represents one of Sharp Special Systems' broadest areas of experience, and includes everything from closed-loop control of a chemical processing plant to on-line systems which allow post office management to monitor the flow of mail through automated sorting plants. We have developed systems for monitoring and controlling gas and water pipeline networks, controlling nuclear reactors, inventory management, conveyor-belt materials handling and many more.

Communications

Sharp Special Systems is a recognized leader in communications and its close ally, distributed processing. Our experience ranges from remote data collection to the state-of-the-art international packet-switching network developed for the SHARP APL timesharing service. We have developed nationwide stock broker trading and information systems, and undertaken research and development projects in this area for the Canadian Ministry of Transport and other Canadian Federal government departments.

On-line Data Entry and Retrieval

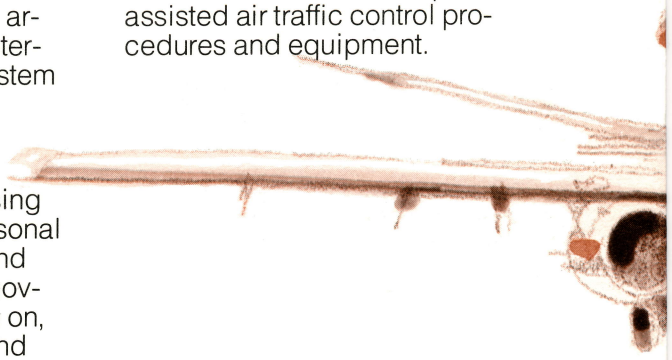
The current trend in data processing is towards on-line data base and enquiry systems as more and more companies are recognizing the advantages of immediate access to automated records. Much of this development has centered around minicomputers, and Sharp Special Systems has implemented, among others, an on-line order entry system for a national wholesale milk distributor in Holland, an on-line system for keeping track of pension, earnings and membership data for a Canadian union of performing artists, and a proprietary computer-assisted microfilm retrieval system called Inspector.

Security

With the automation of increasing amounts of corporate and personal data, concern for its privacy and security has mounted. Many governments have, or are working on, legislation in this area. Data and system access security techniques developed for our SHARP APL timesharing service have been incorporated into many minicomputer-based records systems, and we have, and continue to, participate in research and development projects funded by both Canadian and American federal government departments. One of these is a project to develop a compiler which will produce certifiable code, a requisite for true computer system data security.

Airport Systems

If you have ever flown into Amsterdam's Schiphol airport, your takeoff and landing has been assisted by air traffic control software developed by Sharp Special Systems. We have also developed airport ground support equipment monitoring and control systems as turnkey projects, both for Schiphol and, through the Canadian Ministry of Transport, for all major airports in Canada. We have also developed, for the Canadian government, a system used for research in computer-assisted air traffic control procedures and equipment.



5 System types

6 Hardware Selection

One of the most important aspects of planning a computer system is the choice of computer and peripheral devices. Selecting the right hardware components is crucial to both the success and the cost-effectiveness of any information processing system. And with the variety of minicomputers and peripherals on the market today, it is no easy task.

A recent survey of minicomputers listed over thirty manufacturers, most of which offer several different models of minis. Each has unique operating characteristics and capacities. Choosing the best computer for an application involves both accurately projecting the processing demands of the application and also matching these demands to the appropriate processor.

The growth of the minicomputer industry over the last twenty years has been phenomenal, and a prime contributor has been the relatively low cost of the equipment. Even today, where the addition of larger memory capacities and an increasingly wide range of peripherals has pushed total system prices, in some cases, into the several hundred thousand dollar range, price is still attractive, particularly relative to the costs of owning or renting time on traditional mainframe computers.

The growing sophistication of minicomputer systems has made them applicable to an ever-widening range of applications. It has also severely complicated the process of deciding which system to buy. And although price is an obvious attraction of minicomputers, it is seldom by itself justification for choosing a vendor. Many other factors, such as the quantity and quality of local support, expansibility, ease of programming and so on must be considered, and indeed will have a direct impact on the total cost to you of the system over its life.

Evaluating the advantages and drawbacks of various vendors can be an enormous task, and one that is virtually impossible to do without the benefit of direct experience.

We at Sharp Special Systems have that direct experience. Many of us started working with minicomputers long before the company was formed in 1964. We can put that experience to work for you.

7 Software Selection

Perhaps the most important "characteristic" of any computer system, and one which is rarely examined in sufficient detail during the purchasing cycle, is the system software supplied by the manufacturer. This includes operating systems, language compilers, debugging aids, communications packages, general utility programs and data-base management systems.

Over the life of a computer system, the cost of applications software normally exceeds the cost of the hardware, often by many times. And although the figures which support this premise are derived mainly from the experience of users of large mainframe systems, today it applies equally to minicomputer systems.

Early minicomputers were used almost exclusively to perform one specific, fixed task. Once installed, the software was seldom changed or enlarged, and because of this the quality of programming tools was viewed as relatively unimportant.

Today the situation is quite different, and minicomputers are being used increasingly in environments which are just as "general-purpose" as those of the larger mainframes. At the same time, the number of programming languages and the complexity of operating systems available for minicomputers has increased dramatically.

But the availability of, for example, COBOL on a particular system does not, in itself, necessarily mean very much. Although the once-clear line between minicomputers and mainframes is becoming less and less distinct, minicomputers are nonetheless small. In shoe-horning a language like COBOL onto a mini, a great deal can be lost in the process.

There are almost four times as many companies manufacturing minicomputers as manufacturing mainframe computers. And each of these companies has developed its own systems software. Developing this software is very expensive, and some companies do more of it – and better – than others. Some minicomputer systems software is more sophisticated than that for mainframes. Some of it is bad. And in many cases, it is not a question of bad or good, but rather of suitability to a particular application.

System software is not only important, it is also difficult to evaluate. Weeks can be consumed poring over manuals, but the only real way to assess the worth of a particular vendor's languages or operating systems is to use them.

In addition to our experience with mainframes, Sharp Special Systems has written software for over a dozen different manufacturers' minicomputers. That's the best qualification we can think of to help you decide which system is best suited to your needs.

8 Consulting Services

In addition to building turnkey systems, Sharp Special Systems provides consulting services in all areas of computer systems implementation. Our consulting services can provide you with the added expertise or help you need – when you need it, and without increasing your staff. Highly qualified individuals are available on either a contract or per-diem basis to assist you with –

- project management
- facilities management
- feasibility studies
- system specification and design
- hardware evaluation, selection and acquisition
- system operational audits
- design and selection of communications facilities
- contract programming

Whether you have a particularly knotty problem you need help in solving or a temporary overload of design or programming work, Sharp Special Systems consultants will provide you with the same level of care and competence we employ in producing turnkey systems.

For further information about Sharp's Special Systems Division, contact the nearest Special Systems Division location or any of I.P. Sharp's international branch offices.

9 Sharp Branch Offices

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